

1 37. (Original) The method of claim 36 wherein at least one of the simultaneous operations
2 includes an element insertion operation, the first phase operation task of the element insertion
3 operation being performed on an unlocked portion of the linked data structure.

1 38. (Original) The method of claim 36 wherein at least one of the simultaneous operations
2 includes an element deletion operation, the second phase operation task of the element deletion
3 operation being performed independently of navigation of the linked data structure.

1 39. (Original) The method of claim 36 wherein the first phase operation tasks are
2 asynchronous and use existing links to navigate the linked data structure.

1 40. (Original) The method of claim 36 wherein the first phase operation tasks of more than
2 one of the simultaneous operations are completed before the second phase of any of the
3 simultaneous operations is initiated.

Remarks

5 Claims 1-40 were rejected under 35 U.S.C. 102(b) as being anticipated by
Gostanian et al. U.S. Patent No. 5,781,910, hereafter Gostanian. The Applicant traverses
these rejections.

Regarding Claim 1,

Claim 1 recites:

- 10 1. *A method for executing an operation upon a linked data structure having at least
one element, the method comprising the steps of:*
- (a) *performing a first set of operation tasks in a first phase, the first set of
operation tasks operable to effect a first set of element state transitions;*
 - (b) *developing a second set of operation tasks, the second set of operation
tasks operable to effect a second set of element state transitions, the*
- 15

- second set of element state transitions being distinct from the first set of element state transitions; and*
(c) *performing the second set of operation tasks in a second phase.*

5 With regard to Claim 1, the Examiner states, “Gostanian teaches a method for executing an operation upon a linked data method comprising structure having at least one element, steps of: performing a first set of operation tasks in a phase, the first set of operation tasks operable to effect a first of element state transitions (col. 6 lines 6-17; col. 10 lines 30-50).”

10 The Applicant has reviewed the text cited by the Examiner. Col. 6 lines 6-17 teach processing of a transaction on a database mirrored at several locations. Coordination of the processing at the different locations is managed by a “2 Phase Coordinated Commit” protocol. Col. 10 lines 30-50 teach that the 2 Phase Coordinated Commit protocol is used for non-commutative operations and a “1 Phase Coordinated
15 Commit” protocol is used for commutative operations.

It is the position of the Applicant that the cited text does not teach the limitations of Claim 1 as suggested by the Examiner. First, Claim 1 recites “*an operation upon a linked data structure,*” while the teachings of Gostanian relate to processing of a transaction on a database. Although the linked data structure of the invention may be
20 included in a database, not all databases include linked data structures. For example, the database of Gostanian may include merely flat tables and no linked data structures. The Applicant is unable to find any teaching within Gostanian that the database of Gostanian includes a linked data structure. As such, there does not appear to be any teaching within Gostanian of an operation on a linked data structure.

Second, even if, for the sake of argument, one were to assume that the database of Gostanian included a linked data structure, a two phase transaction on that database would not necessarily teach an operation on the linked data structure that includes a first phase and a second phase, as recited in Claim 1. There are substantial differences
5 between the general concept of processing a transaction and an operation on a linked data structure. A transaction normally includes a series of operations and communications, while an operation on a linked data structure is normally limited to a short set of steps. Thus, it would be simpler to divide transactions such as those taught in Gostanian into sets of operations, and separate phases associated with each set of operations, than it
10 would be to divide an operation on a linked data structure into separate phases. It is, therefore, the position of the Applicant that even if Gostanian were to teach a multiphase transaction, such a teaching would not be sufficient to enable a more difficult two phase operation on a linked data structure as recited in Claim 1.

Third, even if, for the sake of argument, one were to assume that Gostanian taught
15 a multiphase transaction, this transaction would not necessarily include an operation having a first phase and a second phase on a linked data structure, as recited in Claim 1. For example, assuming that the transaction of Gostanian includes two phases and one of these phases includes an operation on a linked data structure, the operation on the linked data structure does not have to be two phase itself. In the prior art, an operation on a
20 linked data structure is not normally divided into two separate phases where distinct sets of state transitions are applied. For example, in the prior art, addition of an element to a linked list is normally performed as a single operation without any sets of sub-operations that would be considered distinct phases. Thus, if Gostanian were to include a

multiphase transaction, that transaction could be multiphase in terms of communication between servers, while only being single phase in terms of operations on a linked data structure. Thus, even if Gostanian were shown to teach a multiphase transaction, this would not be sufficient to show that Gostanian teaches a “*method for executing an*
5 *operation upon a linked data structure,*” wherein the operation includes “*a first phase*” and “*a second phase,*” as recited in Claim 1.

Fourth, Claim 1 recites “*performing a first set of operation tasks operable to effect a first set of element state transitions.*” The Applicant is unable to identify any teaching within the cited art of performing operation tasks to effect “*element state*
10 *transitions.*” Specifically, while Gostanian teaches making changes in the state of a transaction, Gostanian does not appear to teach changing a state of an element. For example, the states of a transaction may include “aborted,” “committed,” or “pending commitment.” In contrast, the states of an element, as described in the specification, can include “pre-associated,” “pending insert,” “valid,” etc. (page 13). These are disjoint sets
15 of states, thus, an element state is different than a transaction state, and teaching a state transition of a transaction does not necessarily teach a state transition of a data element. The Applicant, therefore, requests that the Examiner specifically point out teaching, within the cited art, of “*operation tasks operable to effect a first set of element state transitions,*” or allow Claim 1.

20 Further with regard to Claim 1, the Examiner states, “Gostanian teaches ... developing a second set operation tasks the second operation tasks operable effect a second set element state transitions, the second set of element state transitions being

distinct from the set of element state transitions(col. 13 lines 40-60); and performing second set of operation tasks in a second phase(col. 13 lines 40-65; col. 16 lines 53-57).”

The Applicant has reviewed the text cited by the Examiner. Col. 13 lines 40-65 teach details of a 2 Phase Coordinated Commit Protocol (2PCC), and Col. 16 lines 53-57 teaches that a logging procedure is optional. It is unclear to the Applicant how Col. 16 lines 53-57 relate to the limitations of Claim 1. Also, the Applicant is unable to identify any teaching within the cited text of “*developing a second set of operation tasks*,” or “*tasks operable to effect a second set of element state transitions*,” particularly where “*the second set of element state transitions [are] distinct from the first set of element state transitions*,” as recited in Claim 1. For example, there does not appear to be any teaching that the 2PCC includes two distinct sets of element state transitions to be performed in separate phases. The Applicant, therefore, respectfully requests that the Examiner more specifically point out how the cited text teaches “*developing a second set of operation tasks*,” or allow Claim 1. Further, the Applicant requests that the Examiner specifically point out how the cited text teaches where the second set of operation tasks are “*operable to effect a second set of element state transitions*,” particularly where “*the second set of element state transitions [are] distinct from the first set of element state transitions*,” or allow Claim 1.

It is not clear to the Applicant which aspects of Gostanian are believed by the Examiner to teach element state transitions, much less two distinct sets of element state transitions. The Applicant, therefore, requests that the Examiner point out teaching, within the cited art, of at least two distinct element state transitions that occur in separate phases, or allow Claim 1.

Regarding Claim 2,

Claim 2 recites:

- 5 2. *The method of claim 1 wherein the first set of operation tasks includes navigating existing data structure links.*

Regarding Claim 2, the Examiner states, “Gostanian teaches a method wherein the first set of operation tasks structure links(col. 3 lines 1-21).”

10 The Applicant has reviewed the text cited by the Examiner. Col. 3 lines 1-21 discuss the 2PCC protocol, and include “in a fully replicated environment, any site or link failure brings all activity to a complete halt until the site or link is repaired.”

15 While this text does use the word “link,” the link in Gostanian is a communication link between separate parts (e.g., servers) of a distributed database system, and not “*data structure links*” as recited in Claim 2. The links between servers are physical links for transferring data while “*data structure links*” are typically pointers to memory locations. The cited text is, thus, unrelated to the limitations of Claim 2. The Applicant, therefore, requests that the Examiner specifically point out teaching within the cited art of all the limitations of Claim 2, including “*navigating existing data structure links*,” or allow Claim 2.

20 The Applicant further believes that Claim 2 is allowable for at least the reasons discussed with respect to Claim 1, from which it depends.

Regarding Claim 3,

Claim 3 recites:

3. *The method of claim 1 wherein the step of developing a second set of operation tasks further comprises developing pointers to the data structure, the pointers being used in the step of performing the second set of operation tasks in a second phase.*

5 Regarding Claim 3, the Examiner states, “Gostanian teaches a method wherein step developing a second set of operation tasks further comprises developing pointers the data structure, the pointers being used the step of performing the second set of operation tasks in second phase(col. 13 lines 40-65; col. 16 lines 53-57).”

 The Applicant is unable to identify any discussion of pointers in the cited text. At
10 Col. 13 lines 62-62 there is teaching of “a unique transaction identification code.” However, there is no indication within the cited art that this code is a pointer rather than an index value.

 Further, as the Applicant is unable to identify any discussion of pointers, the Applicant is unable to find any discussion of developing pointers in the first phase (where
15 the “*step of developing a second set of operation tasks*” occurs) and using the developed pointers in the second phase. Thus, the Applicant requests that the Examiner more specifically point out how the cited art teaches “*wherein the step of developing a second set of operation tasks further comprises developing pointers to the data structure,*” and “*the pointers being used in the step of performing the second set of operation tasks in a*
20 *second phase,*” as recited in Claim 3, or allow Claim 3.

 The Applicant further believes that Claim 3 is allowable for at least the reasons discussed with respect to Claim 1, from which it depends.

Regarding Claim 4,

25 Claim 4 recites:

4. *The method of claim 1 wherein operation tasks of the second set of operation tasks are performed atomically.*

With regard to Claim 4, the Examiner states, “Gostanian teaches a method
5 wherein operation tasks operation of the second set tasks are performed atomically (col. 6
lines 19-40).”

The cited text includes teaching of “[a]n atomic multicast” at lines 25-26.

However, according to Claim 1, “*the second set of operation tasks [are] operable to
effect a second set of element state transitions,*” and the atomic multicast of Gostanian
10 does not appear to be operable to effect a second set of element state transitions. The
Applicant, therefore, requests that the Examiner specifically point out which aspects of
the cited art are believed to teach “*the second set of operation tasks,*” and where members
of this set “*are performed atomically,*” as recited in Claim 4, or allow Claim 4.

The Applicant further believes that Claim 4 is allowable for at least the reasons
15 discussed with respect to Claim 1, from which it depends.

Regarding Claim 5,

Claim 5 recites:

5. *The method of claim 1 wherein the step of developing a second set of operation
20 tasks further comprises developing the second set of operation tasks as a list.*

With regard to Claim 5, the Examiner states, “Gostanian teaches a method
wherein the step of developing a second set of operation tasks further comprises
developing the second set of operation tasks as a list (col. 9 lines 43-55).”

25 Col. 9 lines 43-55 teach details of a manager process and one or more worker
processes that communicate with each other over a communications network. The

Applicant is unable to identify any teaching relating to the development of lists, much less a list of operation tasks, within the cited art. The Applicant, therefore, requests that the Examiner more specifically point out those aspects of the cited art that are believed to teach the limitations of Claim 5, or allow Claim 5.

- 5 The Applicant further believes that Claim 5 is allowable for at least the reasons discussed with respect to Claim 1, from which it depends.

Regarding Claim 6,

Claim 6 recites:

- 10 6. *The method of claim 5 wherein the list further comprises a first in last out list.*

With regard to Claim 6, the Examiner states, “Gostanian teaches a method wherein the list further comprises a first in last out list (col. 14 lines 64-67; col. 19 lines 31-40; col. 14 lines 18-41).”

- 15 Col. 14 lines 64-67 teach a log update procedure and a log buffer. Col. 19 lines 31-40 is part of Claim 1 of Gostanian and does not appear to be related to lists much less first in last out lists. Col. 14 lines 18-41 discuss the 2PCC protocol.

- It is unclear to the Applicant how these teachings relate to the limitations of Claim 6. For example, the Applicant is unable to identify any teaching within the cited text relating to lists, much less “*a first in last out list*,” as recited in Claim 6. The Applicant, therefore, requests that the Examiner more specifically point out those aspects of the cited art that are believed to teach the limitations of Claim 6, or allow Claim 6.
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The Applicant further believes that Claim 6 is allowable for at least the reasons discussed with respect to Claim 5, from which it depends.

Regarding Claim 7,

Claim 7 recites:

- 5 7. *The method of claim 1 wherein the step of developing a second set of operation tasks further comprises a step of performing a conflicts check for the operation.*

With regard to Claim 7, the Examiner states, “Gostanian teaches a method wherein the step developing a second set of operations tasks further comprises a step check for the operation performing a conflicts check for the operation (col. 14 lines 20-10 42).”

Col. 14 lines 20-42 discuss the 2PCC protocol. The Applicant is unable to identify any teaching within the cited text relating to a conflicts check. For example, it does not appear to be taught that the 2PCC protocol includes a conflicts check for an operation. The Applicant, therefore, requests that the Examiner more specifically point15 out those aspects of the cited art that are believed to teach the limitations of Claim 7, or allow Claim 7.

The Applicant further believes that Claim 7 is allowable for at least the reasons discussed with respect to Claim 1, from which it depends.

20 **Regarding Claim 8,**

Claim 8 recites:

8. *The method of claim 1 wherein the first set of element state transitions further comprises:*
25 (a) *a valid state to a pending delete state transition;*
 (b) *a pre-associated state to a pending insert state transition; and*
 (c) *a pending insert state to a hidden state transition.*

With regard to Claim 8, the Examiner states, “Gostanian teaches a method wherein the first set of element state transitions further comprises: a valid state to a pending delete state transition(col. 1 lines 10-50;col. 15 lines 10-25); a pre-associated state to a pending insert state transition(col. 1 lines 40-50; col. 13 lines 3-36); and a
5 pending insert state to a hidden state transition (col. 1 lines 40-50;col. 15 lines 10-25,col. 13 lines 3-36).

Col. 1 lines 10-50 discusses distributed databases in general as well as the concepts of transaction commitment, abortion, and rollback. However, these concepts are not known to include any of the three different state transitions recited in Claim 8.
10 Thus, merely teaching commitment, abortion, and rollback does not teach the element state transactions recited in Claim 8.

Further, the concepts taught in Gostanian are related to the commitment, abortion, and rollback of a transaction, while the limitations of Claim 8 are related to state transitions of an “*element*” in a data structure. A transaction does not undergo an
15 insertion or deletion, while a data structure element may. Thus, teaching of a transaction state transition does not teach the data structure element transitions recited in Claim 8.

Col. 15 lines 10-25 and Col. 13 lines 3-36 again relate to commitment or abortion of a transaction. For the reasons discussed above, these teachings do not include the limitations recited in Claim 8.

20 The Applicant requests that the Examiner explain how the concepts of commitment, abortion, and rollback teach each of the three different element state transitions recited in Claim 8, or allow Claim 8.

The Applicant further believes that Claim 8 is allowable for at least the reasons discussed with respect to Claim 1, from which it depends.

Regarding Claim 9,

5 Claim 9 recites:

9. *The method of claim 1 wherein the second set of element state transitions further comprises:*

- (a) *a pending insert state to a valid state transition;*
- (b) *a pending delete state to an invalid state transition;*
- 10 (c) *a hidden state to an invalid state transition;*
- (d) *a pending delete state to a valid state transition;*
- (e) *a hidden state to a pending insert state transition; and*
- (f) *a pending insert state to an invalid state transition.*

15 With regard to Claim 9, the Examiner states:

Gostanian teaches a method the second set of element state transitions further comprises: a pending insert stat to a valid state transition(col. 15 lines 10-25); a pending delete state to an invalid state transition(col. 15 lines 10-25,col. 13 lines 3-36).; a hidden state to an invalid state transition(col. 13 lines 3-36); a pending
20 delete state to a valid state transition; a hidden state to pending insert state transition and a pending insert state to an invalid state transition(col. 15 lines 10-25,col. 13 lines 3-36).

As discussed above with respect to Claim 8, the cited text includes the concepts of
25 abortion, commitment and rollback in the context of a transaction. The Applicant is unable to identify any teaching that these concepts include the five different element state transitions recited in Claim 9. The Applicant requests that the Examiner explain how the concepts of commitment, abortion, and rollback teach each of the five different element state transitions recited in Claim 9, or allow Claim 9.

30 The Applicant further believes that Claim 9 is allowable for at least the reasons discussed with respect to Claim 1, from which it depends.

Regarding Claim 10,

Claim 10 recites:

10. *A method for performing insertion and deletion operations on elements in a linked data structure, the method comprising the steps of:*

- 5 (a) *performing a first set of operation tasks in a first phase for each insertion and deletion operation, the first set of operation tasks operable to effect a first set of element state transitions;*
- (b) *developing a second set of operation tasks for each insertion and deletion operation, the second set of operation tasks operable to effect a second set*
10 *of element state transitions, the second set of element state transitions being distinct from the first set of element state transitions; and*
- (c) *performing the second set of operation tasks in a second phase.*

With regard to Claim 10, the Examiner states, “Claim 10 is rejected based on the
15 same rejection as claim 1 above.”

The Applicant respectfully points out that Claim 10 includes numerous limitations not recited in Claim 1. For example, Claim 10 is toward “[a] *method for performing insertion and deletion operations,*” while Claim 1 is not restricted to these operation types. Further, Claim 10 recites “*performing a first set of operation tasks in a first phase*
20 *for each insertion and deletion operation,*” and “*developing a second set of operation tasks for each insertion and deletion operation, the second set of operation tasks operable to effect a second set of element state transitions,*” which are not recited in Claim 1.

It is the position of the Applicant that, without consideration of these limitations,
25 the Examiner has failed to point out all of the limitations of Claim 10 in the cited art. The Examiner has, thus, not made a prima facie case of rejection under 102(b). The Applicant requests that the Examiner point out teaching of all of the limitations of Claim 10 within the cited art, or allow Claim 10.

The Applicant further believes that Claim 10 is allowable for at least the reasons discussed with respect to Claim 1.

Regarding Claim 11,

5 Claim 11 recites:

11. *A method for executing operations upon a linked data structure having at least one element, the method comprising the steps of:*

- (a) *queuing operation tasks in a task queue;*
- (b) *receiving the queued operation tasks;*
- 10 (c) *performing a first set of operation tasks in a first phase, the first set of operation tasks operable to effect a first set of element state transitions;*
- (d) *developing a second set of operation tasks, the second set of operation tasks operable to effect a second set of element state transitions, the*
15 *second set of element state transitions being distinct from the first set of element state transitions; and*
- (e) *performing the second set of operation tasks in a second phase.*

With regard to Claim 11, the Examiner states, “Claim 11 is rejected based on the same rejections as claim 1 above in addition Gostanian teaches queuing operation tasks in
20 a task queue (col. 19 lines 5-40); and receiving the queued operation tasks (col. 19 lines 5-40).”

Col. 19 lines 5-40 includes Claim 1 of Gostanian, and does not appear to include any teaching of “*queuing operation tasks*” or “*receiving the queued operation tasks*,” as recited in Claim 11. The Applicant, therefore, requests that the Examiner more
25 specifically point out how the cited art teaches the limitations of Claim 11, or allow Claim 11.

The Applicant further believes that Claim 11 is allowable for at least the reasons discussed with respect to Claim 1.

Regarding Claim 12,

The Applicant believes that Claim 12 is allowable for at least the reasons discussed with respect to Claim 11, from which it depends.

5 **Regarding Claim 13,**

Claim 13 recites:

13. *A method of inserting an element into a linked data structure comprising the steps of:*

- 10 (a) *performing a first set of operation tasks in a first phase, the first set of operation tasks operable to effect a first set of element state transitions including a pre-associated state to a pending insert state transition;*
- (b) *developing a second set of operation tasks, the second set of operation tasks operable to effect a second set of element state transitions including a pending insert state to a valid state transition; and*
- 15 (c) *performing the second set of operation tasks in a second phase.*

The Applicant believes that Claim 13 is allowable for at least the reasons discussed with respect to Claims 8 and 10. Specifically, the cited art does not teach the specific state transitions recited in Claim 8 and Claim 13, and the cited art does not teach

20 a “method of inserting an element into a linked data structure” as recited in Claim 13.

The Applicant, therefore, requests that the Examiner specifically point out how the cited art teaches all the limitations recited in Claim 13, or allow Claim 13.

Regarding Claim 14,

25 Claim 14 recites:

14. *The method of claim 13 wherein the pre-associated state to a pending insert state transition is accomplished by:*

- (a) *marking the element to be inserted as being pre-associated to the data structure;*
- 30 (b) *navigating the data structure to an insertion point;*

- (c) *creating links between the element to be inserted and the data structure at the insertion point, the links created being visible only to the insertion operation; and*
- (d) *marking the element as being pending insert.*

5

With regard to Claim 14, the Examiner states:

10 Gostanian teaches a method wherein the pre-associated state to pending insert state transition is accomplished by: marking the element to be inserted as being pre-associated to the data structure(col. 19 lines 16-21); navigating the data structure to an insertion point(col. 1 lines 40-50); creating links between the element to the be inserted and the data structure at the insertion point, the links created being visible only to the insertion operation; and marking the element as being pending insert (col. 1 lines 40-50;col. 15 lines 10-25,col. 13 lines 3-36).

15 Col. 19 lines 16-21 include part of Claim 1 of Gostanian and concern designation of a selected application server as a coordinator for a selected transaction, etc. The Applicant is unable to discern any relationship between the cited text and the limitations of Claim 14 as suggested by the Examiner. The Applicant, therefore, requests that the Examiner clarify how the cited text teaches “*wherein the pre-associated state to pending*
20 *insert state transition is accomplished by: marking the element to be inserted as being pre-associated to the data structure,*” or allow Claim 14.

Col. 1 lines 40-50 concern distributed databases in general and introduces the concepts of commitment, abortion and rollback. The Applicant is unable to identify any teaching of “*navigating the data structure to an insertion point,*” or “*creating links*
25 *between the element to be inserted and the data structure at the insertion point, the links created being visible only to the insertion operation; and marking the element as being pending insert,*” as recited in Claim 14, within the cited text. The Applicant, therefore, requests that the Examiner specifically point out these teachings within the cited art, or allow Claim 14.

Col. 15 lines 10-25 concern logging and the concepts of commitment, abortion and rollback. The Applicant is unable to identify any teaching of “*creating links between the element to be inserted and the data structure at the insertion point, the links created being visible only to the insertion operation; and marking the element as being pending insert,*” as recited in Claim 14, within the cited text. The Applicant, therefore, requests that the Examiner specifically point out how the cited art teaches these limitations of Claim 14, or allow Claim 14.

Col. 13 lines 3-36 concern additional teaching that does not appear to be related to “*creating links between the element to be inserted and the data structure at the insertion point, the links created being visible only to the insertion operation; and marking the element as being pending insert,*” as recited in Claim 14. The Applicant, therefore, requests that the Examiner specifically point out how the cited art teaches the limitations of Claim 14, or allow Claim 14.

The Applicant further believes that Claim 14 is allowable for at least the reasons discussed with respect to Claim 13, from which it depends.

Regarding Claim 15,

Claim 15 recites:

15. *The method of claim 14 wherein the pending insert state to a valid state transition is accomplished by:*
- (a) *creating instructions for making the created links visible to all operations; and*
 - (b) *creating instructions for making existing links at the insertion point invisible to all operations.*

With regard to Claim 15, the Examiner states, “Gostanian teaches a method wherein pending insert state a valid state transition accomplished by: creating

instructions for making created links visible to all operations(col. 1 lines 40-50; col. 19 lines 16-21); and creating instructions for making existing links at the insertion point invisible to operations (col. 1 lines 40-50;col. 15 lines 10-25,col. 13 lines 3-36).”

5 The Applicant is unable to identify teachings of either “*creating instructions for making the created links visible to all operations*” or “*creating instructions for making existing links at the insertion point invisible to all operations,*” within the cited art. There does not appear to be any teaching of making links visible or invisible in Gostanian. The Applicant, therefore, requests that the Examiner more specifically point out teachings of the above limitations within the cited art, or allow Claim 15.

10 The Applicant further believes that Claim 15 is allowable for at least the reasons discussed with respect to Claim 14, from which it depends.

Regarding Claim 16,

Claim 16 recites:

15 16. The method of claim 15 wherein the step of performing the second set of operation tasks further comprises executing the created instructions including marking the element as valid.

20 With regard to Claim 16, the Examiner states, “Gostanian teaches a method wherein the step of performing the second set of operation tasks further comprises executing the created instructions including marking the element as valid (col. 14 lines 64-67;col. 19 lines 31-40; col. 14 lines 18-41).”

The Applicant is unable to identify teachings of “*wherein the step of performing the second set of operation tasks further comprises executing the created instructions*
25 *including marking the element as valid,*” within the cited art. For example, there does not

appear to be any teaching of marking an element as valid in Gostanian. The Applicant, therefore, requests that the Examiner specifically point out teachings of the above limitations within the cited art, or allow Claim 16.

The Applicant further believes that Claim 16 is allowable for at least the reasons
5 discussed with respect to Claim 15, from which it depends.

Regarding Claim 17,

Claim 17 recites:

- 10 17. *A method of deleting an element ~~into~~from a linked data structure comprising the steps of:*
- (a) *performing a first set of operation tasks in a first phase, the first set of operation tasks operable to effect a first set of element state transitions including a valid state to a pending delete state transition;*
 - 15 (b) *developing a second set of operation tasks, the second set of operation tasks operable to effect a second set of element state transitions including a pending delete state to an invalid state transition; and*
 - (c) *performing the second set of operation tasks in a second phase.*

It is the position of the Applicant that Claim 17 is allowable for at least reasons
20 similar to those discussed above with respect to Claims 1 and 10. Specifically, the cited art does not teach, “*deleting an element from a linked data structure,*” “*a first set of element state transitions including a valid state to a pending delete state transition,*” or “*a second set of element state transitions including a pending delete state to an invalid state transition.*” These limitations do not appear to be taught in the art cited by the
25 Examiner. The Applicant, therefore, requests that Examiner specifically point out teachings of these limitations within the cited art, or allow Claim 17.

Further, with regard to Claim 17, the Examiner states “Claims 17-20 are rejected based on the same rejections as claims 13-16 above.” The Applicant respectfully points

out that Claim 17 includes limitations not recited in Claims 13-16. For example, Claim 17 is directed toward “[a] method of deleting an element from a linked data structure,” and Claim 17 recites “a valid state to a pending delete state transition” and “a pending delete state to an invalid state transition.” Because these claim limitations are not addressed by the Examiner, the Examiner has not made a prima facie case for the rejection of Claim 17 under 102(b). The Applicant requests that the Examiner point out teachings of all the limitations of Claim 17 in the cited art, or allow Claim 18.

Regarding Claim 18,

Claim 18 recites:

18. *The method of claim 17 wherein the valid state to a pending delete state transition is accomplished by:*

- (a) *navigating the data structure to a deletion point;*
- (b) *creating links at the deletion point visible only to the deletion operation;*
- and
- (c) *marking the element to be deleted as pending delete.*

With regard to Claim 18, the Examiner states, “Claims 17-20 are rejected based on the same rejections as claims 13-16 above.”

The Applicant respectfully points out that Claim 18 recites limitations not included in Claims 13-16. Specifically, Claim 18 recites “*navigating the data structure to a deletion point*,” “*creating links at the deletion point visible only to the deletion operation*” and “*marking the element to be deleted as pending delete*,” which are not recited in Claims 13-16. Because these claim limitations are not addressed by the Examiner, the Examiner has not made a prima facie case for the rejection of Claim 18 under 102(b). The Applicant requests that the Examiner point out teachings of all the limitations of Claim 18 in the cited art, or allow Claim 18.

The Applicant further believes that Claim 18 is allowable for at least the reasons discussed with respect to Claim 17, from which it depends.

Regarding Claim 19,

5 Claim 19 recites:

19. *The method of claim 18 wherein the pending delete state to an invalid state transition is accomplished by:*

- (a) *creating instructions for making the created links visible to all operations;*
and
- 10 (b) *making existing links at the deletion point invisible to all operations.*

With regard to Claim 19, the Examiner states, "Claims 17-20 are rejected based on the same rejections as claims 13-16 above."

The Applicant respectfully points out that Claim 19 includes limitations that are
15 not recited in Claims 13-16. Specifically, Claim 19 recites "*creating instructions for making the created links visible to all operations*" and "*making existing links at the deletion point invisible to all operations,*" which are not recited in Claims 13-16.

Because these claim limitations are not addressed by the Examiner, the Examiner has not made a prima facie case for the rejection of Claim 19 under 102(b). The Applicant
20 requests that the Examiner point out teachings of all the limitations of Claim 19 in the cited art, or allow Claim 19.

The Applicant further believes that Claim 19 is allowable for at least the reasons discussed with respect to Claim 18, from which it depends.

25 **Regarding Claim 20,**

Claim 20 recites:

20. *The method of claim 19 wherein the step of performing the second set of operation tasks further comprises executing the instructions including marking the element to be deleted as invalid.*

5 With regard to Claim 20, the Examiner states, "Claims 17-20 are rejected based on the same rejections as claims 13-16 above."

The Applicant respectfully points out that Claim 20 includes limitations not recited in Claims 13-16. Specifically, Claim 20 recites "*wherein the step of performing the second set of operation tasks further comprises executing the instructions including*
10 *marking the element to be deleted as invalid.*," which is not recited in Claims 13-16. Because these claim limitations are not addressed by the Examiner, the Examiner has not made a prima facie case for the rejection of Claim 20 under 102(b). The Applicant requests that the Examiner point out teachings of all the limitations of Claim 20 in the cited art, or allow Claim 20.

15 The Applicant further believes that Claim 20 is allowable for at least the reasons discussed with respect to Claim 19, from which it depends.

Regarding Claim 21,

Claim 21 recites:

- 20 21. *A method for executing an operation upon a linked data structure having at least one element, the method comprising the steps of:*
- (a) *grouping a first plurality of operation tasks of the operation in a first set of operation tasks, the first set of operation tasks operable to effect a first set of element state transitions;*
 - 25 (b) *performing the first set of operation tasks in a first phase;*
 - (c) *grouping a second plurality of operation tasks of the operation in a second set of operation tasks, the second set of operation tasks operable to effect a second set of element state transitions, the second set of element state transitions being distinct from the first set of element state transitions; and*
 - 30 (d) *performing the second set of operation tasks in a second phase.*

With regard to Claim 21, the Examiner states, "Claim 21 is rejected based on the same rejection as claim 10 above."

The Applicant points out that Claim 10 does not include "*grouping a first plurality of operation tasks of the operation in a first set of operation task*" or "*grouping a second plurality of operation tasks of the operation in a second set of operation tasks*,"
5 as recited in Claim 21.

Because these claim limitations are not addressed by the Examiner, the Examiner has not made a prima facie case for the rejection of Claim 21 under 102(b). The Applicant requests that the Examiner point out teachings of all the limitations of Claim
10 21 in the cited art, or allow Claim 21.

The Applicant further believes that Claim 21 is allowable for at least the reasons discussed with respect to Claim 10.

Regarding Claim 22,

15 Claim 22 recites:

22. *A method for executing an operation upon a linked data structure having at least one element, the method comprising the steps of:*

- (a) *creating first and second sets of operation tasks, the first set of operation tasks being characterized by navigation of the linked data structure using at least an existing link, and the second set of operation tasks being distinct from the first set of operation tasks and being characterized by at least a pointer to the linked data structure; and*
20
- (b) *performing the first set of operation tasks in a first phase and the second set of operation tasks in a second phase.*
25

With regard to Claim 22, the Examiner states, "Claim 22 is rejected based on the same rejection as claim 13 above."

The Applicant points out that Claim 13 does not include “*creating first and second sets of operation tasks,*” “*the first set of operation tasks being characterized by navigation of the linked data structure using at least an existing link,*” or “*the second set of operation tasks being distinct from the first set of operation tasks and being*
5 *characterized by at least a pointer to the linked data structure.*”

Because these claim limitations are not addressed by the Examiner, the Examiner has not made a prima facie case for the rejection of Claim 22 under 102(b). The Applicant, therefore, requests that the Examiner point out teachings of all the limitations of Claim 22 in the cited art, or allow Claim 22.

10 The Applicant further believes that Claim 22 is allowable for at least the reasons discussed with respect to Claims 1 and 3 above.

Regarding Claim 23,

Claim 23 recites:

- 15 23. A method for executing an operation upon a linked data structure having at least one element, the method comprising the steps of:
- (a) dividing the operation into first and second distinct sets of operation tasks;
 - (b) performing the first set of operation tasks in a first phase; and
 - 20 (c) performing the second set of operation tasks in a second phase.

With regard to Claim 23 the Examiner states:

25 Gostanian teaches a method for executing an operation upon a linked data structure having least one element, the method comprising steps of: dividing the operation into first and second distinct sets operation tasks(col. 13 lines 40-65; col. 16 lines 53-57); performing the first set operation tasks first phase(col. 11 lines 12-40); and second set of operation tasks in performing the second phase(col. 13 lines 40-46).

Col. 13 lines 40-65 concern details of the 2PCC protocol. However, the Applicant is unable to identify any teaching that the 2PCC protocol includes “*first and second distinct sets of operation tasks*,” as recited in Claim 23. Even if, for the sake of argument, one were to assume that Gostanian teaches dividing an operation into two sets of tasks to be performed in different phases, these tasks do not appear to be distinct. For example, the transaction of Gostanian appears to include communication between servers in all parts of a transaction. Thus, there are no “*distinct*” sets of operation tasks in Gostanian.

Col. 16 lines 53-57 concern logging in the 1PCC and 2PCC protocols and do not appear to be related to the limitations of Claim 23. The Applicant requests that the Examiner specifically point out how the cited text teach limitations of Claim 23, or allow Claim 23.

Col. 11 lines 12-40 concern the 1PCC protocol, which by definition (see Gostanian Col. 11 line 11) includes only one phase, not two phases. This text, therefore, does not appear to be related to the limitations of Claim 23. The Applicant requests that the Examiner specifically point out which parts of this text are thought to teach limitations of Claim 23, or allow Claim 23.

The Applicant requests that the Examiner specifically point out teaching within the cited art of all limitations in Claim 23, or allow Claim 23.

Regarding Claim 24,

Claim 24 recites:

24. *The method of claim 23 wherein the first set of operation tasks is operable to maintain the linked data structure in an existing linked state.*

With regard to Claim 24, the Examiner states, “Gostanian teaches a method wherein the first set of operation tasks operable to maintain the linked data structure existing linked state(col. 14 lines 64-67;col. 19 lines 31-40; col. 14 lines 18-41).” This text has been discussed above.

The Applicant has reviewed the text cited by the Examiner and is unable to identify any teaching of “*maintain the linked data structure in an existing linked state*” as recited in Claim 24. The Applicant, therefore, requests that the Examiner specifically point out those aspects of Gostanian thought to teach “*maintain the linked data structure in an existing linked state,*” or allow Claim 24.

The Applicant further believes that Claim 24 is allowable for at least the reasons discussed with respect to Claim 23, from which it depends.

Regarding Claim 25,

Claim 25 recites:

25. *The method of claim 24 wherein the second set of operation tasks operable to modify the existing linked state.*

With regard to Claim 25, the Examiner states, “Gostanian teaches a method wherein the first set of operation tasks operable to maintain the linked data structure existing linked state(col. 14 lines 64-67;col. 19 lines 31-40; col. 14 lines 18-41).”

As with Claim 24, the Applicant has reviewed the text cited by the Examiner and is unable to identify any teaching of “*the second set of operation tasks operable to modify the existing linked state*” as recited in Claim 25. The Applicant, therefore, requests that the Examiner specifically point out those aspects of Gostanian thought to teach “*the*

second set of operation tasks operable to modify the existing linked state,” or allow Claim 25.

The Applicant further believes that Claim 25 is allowable for at least the reasons discussed with respect to Claim 24, from which it depends.

Regarding Claim 26,

Claim 26 recites:

26. *The method of claim 23 wherein the first set of operation tasks is visible only to the operation.*

With regard to Claim 26, the Examiner states, “Gostanian teaches a method wherein first of operation tasks is visible only to the operation (col. 1 lines 40-50; col. 15 lines 10-25; col. 13 lines 40-65; col. 16 lines 53-57).”

The Applicant has reviewed the text cited by the Examiner and is unable to identify any teaching of “*the first set of operation tasks is visible only to the operation*” as recited in Claim 26. The Applicant, therefore, requests that the Examiner specifically point out those aspects of Gostanian thought to teach “*the first set of operation tasks is visible only to the operation,*” or allow Claim 26.

The Applicant further believes that Claim 26 is allowable for at least the reasons discussed with respect to Claim 23, from which it depends.

Regarding Claim 27,

Claim 27 recites:

27. *The method of claim 26 wherein the second set of operation tasks is visible to each of a plurality of operations upon the linked data structure.*

With regard to Claim 27, the Examiner states, “Gostanian teaches a method wherein the second set of operation tasks is visible to each plurality of operations upon the linked data structure(col. 13 lines 40-46).”

The Applicant has reviewed the text cited by the Examiner and is unable to
5 identify any teaching of “*the second set of operation tasks is visible to each of a plurality of operations upon the linked data structure*” as recited in Claim 27. The Applicant, therefore, requests that the Examiner specifically point out those aspects of Gostanian thought to teach “*the second set of operation tasks is visible to each of a plurality of operations upon the linked data structure,*” or allow Claim 27.

10 The Applicant further believes that Claim 27 is allowable for at least the reasons discussed with respect to Claim 26, from which it depends.

Regarding Claim 28,

Claim 28 recites,

- 15 28. *A system for executing an operation upon a linked data structure having at least one element, the system comprising:*
- (a) *a memory for storing the linked data structure;*
 - (b) *a processor coupled to the memory, the processor operable to perform a*
20 *first set of operation tasks in a first phase, the first set of operation tasks operable to effect a first set of element state transitions, to develop a*
second set of operation tasks, the second set of operation tasks operable to
effect a second set of element state transitions, the second set of element
state transitions being distinct from the first set of element state
25 *transitions, and to perform the second set of operation tasks in a second phase.*

The Applicant believes that Claim 28 is allowable for the same reasons discussed above with respect to Claim 1.

Regarding Claim 29,

Claim 29 recites:

29. *A system for executing an operation upon a linked data structure having at least one element, the system comprising:*

- (a) *a memory for storing the linked data structure;*
- (b) *a processor coupled to the memory and operable to divide the operation into first and second distinct sets of operation tasks, perform the first set of operation tasks in a first phase, and perform the second set of operation tasks in a second phase.*

The Applicant believes that Claim 29 is allowable for the same reasons discussed above with respect to Claim 23.

Regarding Claim 30,

Claim 30 recites:

30. *A computer readable medium for executing an operation upon a linked data structure having at least one element, the computer readable medium comprising:*

- (a) *a code segment for performing a first set of operation tasks in a first phase, the first set of operation tasks operable to effect a first set of element state transitions;*
- (b) *a code segment for developing a second set of operation tasks, the second set of operation tasks operable to effect a second set of element state transitions, the second set of element state transitions being distinct from the first set of element state transitions;*
- (c) *a code segment for performing the second set of operation tasks in a second phase.*

The Applicant believes that Claim 30 is allowable for the same reasons discussed above with respect to Claim 1.

Regarding Claim 31,

Claim 31 recites:

31. *A computer readable medium for executing an operation upon a linked data structure having at least one element, the computer readable medium comprising:*

- (a) *a code segment for dividing the operation into first and second distinct sets of operation tasks;*
- (b) *a code segment for performing the first set of operation tasks in a first phase; and*
- 5 (c) *a code segment for performing the second set of operation tasks in a second phase.*

The Applicant believes that Claim 31 is allowable for the same reasons discussed above with respect to Claim 23.

10

Regarding Claim 32,

Claim 32 recites:

32. *A system for executing an operation upon a linked data structure having at least one element, the system comprising:*

- 15 (a) *a means for performing a first set of operation tasks in a first phase, the first set of operation tasks operable to effect a first set of element state transitions;*
- (b) *a means for developing a second set of operation tasks, the second set of operation tasks operable to effect a second set of element state transitions, the second set of element state transitions being distinct from the first set of element state transitions; and*
- 20 (c) *a means for performing the second set of operation tasks in a second phase.*

25 The Applicant believes that Claim 32 is allowable for the same reasons discussed above with respect to Claim 1.

Regarding Claim 33,

Claim 33 recites:

30 33. *A system for executing an operation upon a linked data structure having at least one element, the system comprising:*

- (a) *a means for dividing the operation into first and second distinct sets of operation tasks;*
- (b) *a means for performing the first set of operation tasks in a first phase; and*
- 35 (c) *a means for performing the second set of operation tasks in a second phase.*

The Applicant believes that Claim 33 is allowable for the same reasons discussed above with respect to Claim 23.

5 **Regarding Claim 34,**

Claim 34 recites:

34. *A method for executing an operation upon a linked data structure having at least one element, the method comprising the steps of:*

- 10 (a) *creating a first set of operation tasks, the first set of operation tasks being characterized by navigation of the linked data structure using at least an existing link;*
- (b) *creating a second set of operation tasks, the second set of operation tasks being different from the first set of operation tasks and being*
15 *characterized by location of elements within the linked data structure using at least one pointer created by the first set of operation tasks; and*
- (c) *performing at least one operation task of the first set of operation tasks in a first phase and at least one operation task of the second set of operation tasks in a second phase.*

20 With regard to Claim 34, the Examiner states, "Claim 34 is rejected based on the same rejection as claims 13 and 22 above."

The Applicant points out that Claims 13 and 22 do not include "*location of elements within the linked data structure using at least one pointer created by the first set of operation tasks,*" as recited in Claim 34.

25 Because these claim limitations are not addressed by the Examiner, the Examiner has not made a prima facie case for the rejection of Claim 34 under 102(b). The Applicant requests that the Examiner point out teachings of all the limitations of Claim 34 in the cited art, or allow Claim 34.

 The Applicant further believes that Claim 34 is allowable for the same reasons
30 discussed with respect to Claims 13 and 22.

Regarding Claim 35,

Claim 35 recites:

- 5 35. *The method of claim 34 wherein the first set of operation tasks is operable to maintain consistent navigation of the linked data structure.*

With regard to Claim 35, the Examiner states, "Claim 35 is rejected based on the same rejection as claim 2 above."

10 The Applicant points out that Claim 2 recites "*wherein the first set of operation tasks includes navigating existing data structure links,*" while Claim 35 recites "*operable to maintain consistent navigation of the linked data structure.*" There is a significant difference between navigation of an existing data structure and maintaining consistent navigation of a linked data structure. For example, operations that navigate an existing data structure could easily modify navigation of that data structure, and thus fail to
15 maintain consistent navigation. The Examiner does not appear to have addressed these differences. The Applicant, therefore, requests that the Examiner point out teachings of all the limitations of Claim 35 in the cited art, or allow Claim 35.

The Applicant further believes that Claim 35 is allowable for at least the reasons discussed with respect to Claim 34, from which it depends.

20

Regarding Claim 36,

Claim 36 recites:

- 25 36. *A consistent method of executing simultaneous operations on a linked data structure having at least one element, the method comprising the steps of:*
 performing any first phase operation task of each of the simultaneous operations in a first phase using parallel processes;
 developing a set of serial operations during the first phase; and

performing any second phase operation task of each of the simultaneous operations in a second phase, the second phase operation task including at least one of the set of serial operations.

5 With regard to Claim 36, the Examiner states, "Claim 36 is rejected based on the same rejections as claims 1 and 22 above."

The Applicant points out that Claims 1 and 22 are methods for "executing an operation," while Claim 36 is directed toward a method "of executing *simultaneous operations*." Further, Claim 36 recites "performing any first phase operation task of
10 *each of the simultaneous operations in a first phase using parallel processes,*" "developing a set of serial operations during the first phase," and "the second phase operation task including at least one of the set of serial operations," which are not recited in Claims 1 or 22.

Because these claim limitations are not addressed by the Examiner, the Examiner
15 has not made a prima facie case for the rejection of Claim 34 under 102(b). The Applicant requests that the Examiner point out teachings of all the limitations of Claim 36 in the cited art, or allow Claim 36.

The Applicant further believes that Claim 36 is allowable for at least the reasons discussed with respect to Claims 22, 23 and 34.

20

Regarding Claim 37,

Claim 37 recites:

25 *37. The method of claim 36 wherein at least one of the simultaneous operations includes an element insertion operation, the first phase operation task of the element insertion operation being performed on an unlocked portion of the linked data structure.*

With regard to Claim 37, the Examiner states, "Claims 37-39 are rejected based on the same rejection as Claims 14-16 above."

The Applicant points out that Claim 37 recites limitations not included in Claims 14-16. For example, Claim 37 recites "*simultaneous operations*," and "*being performed on an unlocked portion of the linked data structure*," which are not recited in Claims 14-16.

Because these claim limitations are not addressed by the Examiner, the Examiner has not made a prima facie case for the rejection of Claim 37 under 102(b). The Applicant requests that the Examiner point out teachings of all the limitations of Claim 37 in the cited art, or allow Claim 37.

The Applicant further believes that Claim 37 is allowable for at least the reasons discussed with respect to Claim 36, from which it depends.

Regarding Claim 38,

Claim 38 recites:

38. *The method of claim 36 wherein at least one of the simultaneous operations includes an element deletion operation, the second phase operation task of the element deletion operation being performed independently of navigation of the linked data structure.*

With regard to Claim 37, the Examiner states, "Claims 37-39 are rejected based on the same rejection as Claims 14-16 above."

The Applicant points out that Claim 38 recites limitations not included in Claims 14-16. For example, Claim 38 recites "*simultaneous operations*," "*one of the simultaneous operations includes an element deletion operation*," and "*the element*

deletion operation being performed independently of navigation of the linked data structure,” which are not recited in Claims 14-16.

Because these claim limitations are not addressed by the Examiner, the Examiner has not made a prima facie case for the rejection of Claim 37 under 102(b). The

5 Applicant requests that the Examiner point out teachings of all the limitations of Claim 37 in the cited art, or allow Claim 37.

The Applicant further believes that Claim 38 is allowable for at least the reasons discussed with respect to Claim 36, from which it depends.

10 **Regarding Claim 39,**

Claim 39 recites:

39. The method of claim 36 wherein the first phase operation tasks are asynchronous and use existing links to navigate the linked data structure.

15 With regard to Claim 39, the Examiner states, “Claims 37-39 are rejected based on the same rejection as Claims 14-16 above.”

The Applicant points out that Claim 39 recites limitations not included in Claims 14-16. For example, Claim 39 recites “*the first phase operation tasks are asynchronous,*” which is not recited in Claims 14-16.

20 Because these claim limitations are not addressed by the Examiner, the Examiner has not made a prima facie case for the rejection of Claim 39 under 102(b). The Applicant requests that the Examiner point out teachings of all the limitations of Claim 39 in the cited art, or allow Claim 39.

The Applicant further believes that Claim 39 is allowable for at least the reasons
25 discussed with respect to Claim 36, from which it depends.

Regarding Claim 40,

Claim 40 recites:

5 40. *The method of claim 36 wherein the first phase operation tasks of more than one of the simultaneous operations are completed before the second phase of any of the simultaneous operations is initiated.*

With regard to Claim 40, the Examiner states, "Claim 40 is rejected based on the same rejection as claim 16 above."

10 The Applicant points out that Claim 40 recites limitations not included in Claim 16. For example, Claim 40 recites "*more than one of the simultaneous operations,*" and "*the simultaneous operations are completed before the second phase of any of the simultaneous operations is initiated,*" which are not recited in Claim 16.

15 Because these claim limitations are not addressed by the Examiner, the Examiner has not made a prima facie case for the rejection of Claim 40 under 102(b). The Applicant requests that the Examiner point out teachings of all the limitations of Claim 40 in the cited art, or allow Claim 40.

The Applicant further believes that Claim 40 is allowable for at least the reasons discussed with respect to Claim 36, from which it depends.

20

The Applicant believes that all pending claims are allowable and respectfully requests that the Examiner issue a Notice of Allowance. Should the Examiner have questions, the Applicant's undersigned representative may be reached at the number
5 provided below.

Respectfully submitted,

Clifford L. Hersh

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